

**PASO ROBLES GROUNDWATER BASIN  
RESOURCE CAPACITY STUDY (RCS)  
QUESTIONS AND ANSWERS**

The Board of Supervisors and the Planning Commission held a well-attended joint hearing on the RCS on November 9, 2010. The Board and Commission heard staff presentations from the Planning and Building, Public Works and Public Health Departments and three hydrogeology experts, two of whom have been conducting studies on the Paso Robles Groundwater Basin (the basin) for many years. The RCS is based on the technical studies completed by these hydrogeology experts.

Board members, Commissioners and the public asked many questions at the joint hearing. Board Chairman Mecham asked staff to post the questions and answers to the questions on the Planning and Building Department's website. The following questions and answers are grouped into rough subject areas such as the Atascadero Sub-basin, water demand, and basin characteristics.

**1. How long a period of time is there between reaching perennial yield and when the basin is in overdraft?**

The perennial yield of a groundwater basin is based on many years of study of the inflows into the basin. In the case of the Paso Robles Groundwater Basin, all inflows are from rain that falls in the basin. There are years of heavy rain and years of little rain. The amount of rainfall over a 17-year wet/dry period has been used to develop perennial yield. The perennial yield is reached when the volume of outflows reaches the volume of **average** inflow. It is the conclusion of the three expert hydrogeologists in attendance at the joint hearing that the basin has about reached its perennial yield. The pumping of a groundwater basin so that outflows exceed inflows over a period of time results in a condition of overdraft.

**2. Is adequate data available through the technical studies on which to base recommendations?**

According to Paul Sorensen, hydrogeologist with Fugro, the data available at this time are adequate upon which to base our decisions.

**3. Has a Level of Severity (LOS) ever gone from I directly to III?**

In 2004, the Nipomo Mesa area went from no LOS to an LOS III as a result of the Nipomo Water Supply RCS.

**4. Does an LOS III change any of the studies we would want to do in the future?**

No. There is still additional work to do in the basin. For example, as outlined in Fugro's 2010 Water Balance Review and Update,

*"The results of this study reinforce the need for implementation of an effective basin monitoring and management plan. The results also demonstrate the need to update the County's numerical groundwater flow model, which was developed by Fugro and is based on data through 1997. An update and recalibration of the model would help to refine the many uncertainties and assumptions that were used throughout this water balance update."*

**5. What is the difference between an LOS III and a certified LOS III?**

The Resource Management System requires the Board to "certify" a Level of Severity if actions recommended in an RCS are to be implemented. Until the Board of Supervisors certifies an LOS, no conclusions are adopted and no action is taken.

**6. How is demand for water regulated when the overlayers have certain rights to use groundwater?**

Jurisdictions can only use the authority they have. The County uses its land use authority to address water issues. The County has general plan policies in place to address these types of groundwater issues, not by regulating water use (an authority the County does not have), but by addressing the land uses that use groundwater.

**7. As long as supplemental water is available, can an LOS II be considered?**

If enough supplemental water were available to lead the basin out of an LOS III, then an LOS II may be appropriate. In the case of the Paso Robles Groundwater Basin, supplemental water from Lake Nacimiento has already been included in the water balance forecast scenarios. The unallocated 6,000 acre-feet of Nacimiento supplemental water is not enough to bring outflows under inflows in the main basin. However, an additional 6,000 acre feet of supplemental water, together with the requisite reduction in pumping, could lead the Atascadero Sub-basin to a lower LOS.

**8. Does a certified LOS III lead to a moratorium?**

A development moratorium is one of several possible actions that can be taken to address an LOS III, as described in Framework for Planning of the Land Use Element:

*“3. A moratorium on land development or other appropriate measures shall be enacted in the area that is affected by the resource problem until such time that the project provides additional resource capacity to support such development (Amended 1990, Ord. 2443; 1995, Ord. 2740).”*

A development moratorium is not recommended by this RCS. Two other groundwater basins with certified LOS III, Los Osos and the Nipomo Mesa Management Area, do not have development moratoria.

**9. Land use controls recommended in the RCS only affect unincorporated areas. Cities are still free to subdivide and development. Is this fair?**

The County has a responsibility to do what it can within its authority to help resolve this critical water situation. The land use and other measures recommended by the RCS are based on the analyses in the technical reports and on County policy. For example, the County General Plan states that agricultural uses should have priority for use of groundwater. Therefore, the RCS recommendations must be consistent with this policy.

An important consideration is that water customers in the Cities of Paso Robles and Atascadero are spending almost \$200 million to bring water from Lake Nacimiento to offset future groundwater pumping and supply future demand. These efforts should be recognized. Accordingly, it makes sense for development in the cities to be treated differently. In any case, the County has no authority to regulate land use in the cities.

**10. Is the basin structurally complex or simple?**

According to Paul Sorensen, the basin is not structurally complex. It's just very large.

**11. Have we considered the effects of climate change?**

The following is an excerpt from the September 9, 2010 Planning Commission Study session staff report:

*Fugro's 2010 Water Balance Review and Update expressly states that potential effects of climate change were not included in the water balance forecasts. The County has been involved in a substantial effort to gauge the various potential effects of climate change on natural systems, including water supply. A July 2010 workshop sponsored by the Local Government Commission discussed the effects of climate change on local resources.*

*Several studies conducted for the State of California, as well as the National Center for Conservation Science and Policy report entitled “Projected Future Climatic and Ecological Conditions in San Luis Obispo County,” all predict regional changes in temperature, precipitation, vegetation, wildfire and sea level. In short, climate change could lead to the following changes in San Luis Obispo County:*

- *Increase in inland temperatures*
- *Increasing droughts*
- *Increasing severity of storms/rainfall events, resulting in intense runoff events and inland flooding*
- *Change in the number of fog days along the coast (potential for decrease or increase).*

**12. Has the RCS considered all the legal lots that could be developed with just ministerial permits?**

The RCS has considered these lots and their potential for increased water demand in the rural pumping sector. The RCS recommendation to limit the rate of growth is in response to the development potential of these lots.

**13. Is there flexibility in crop choices?**

The choice of crops to plant on any given property is up to the owner. Much of the pumping in the basin (outflows) is based on thousands of individual decisions made by individual property owners. These decisions include not only how much water to use domestically, but also what type of crop to plant in a given location.

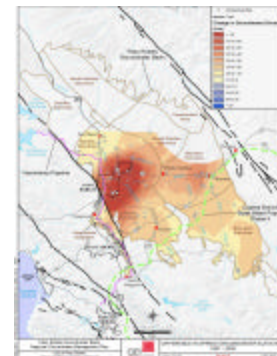
**14. Do earthquakes have an effect on the perennial yield?**

Perhaps. However, it is known that seismic events can have an effect on the water available from fractured rock formations.

**15. Is the whole basin in decline? Which areas of the basin need to be addressed?**

There are areas of the basin in decline and others where groundwater levels are not in decline. For example, some wells in the Creston area have experienced locally rising water levels. The 2009 Todd report concludes that this is due to a shift in crop type away from high water-using alfalfa.

Considering the entire basin, experts believe it



faces a threat to overdraft unless preemptive measures are taken. According to the Department of Water Resources, a basin needs to be addressed as a whole. This is so water users in different areas of the basin do not get into finger pointing and instead work cooperatively to address basin problems.

**16. Is there a standard buffer, reserve or safety factor to use in planning for water supply and demand? What is the “plan B”?**

There does not appear to be a standard reserve for water supply and demand. In addition, the RCS does not specifically address a plan for contingencies such as prolonged drought, overdrafting, or some catastrophe involving water supplies. Recommendations for these potential issues should be worked out in conjunction with a suite of actions to protect the basin. There are numerous examples, however, of their use. CSA 10A in Cayucos calculates system demand, adds other factors such as outstanding will-serve letters and then adds a 10% reserve. The reserve is meant to ensure that the system does not become oversubscribed.

In the case of groundwater supply and demand, it's very important to use conservative estimates. The underlying reason is that if the supply estimate is too large or the demand estimate is too small, there is no room for error. The safest way to treat supply/demand equations is to be conservative in all estimates of both supply and demand and then perhaps add a buffer of a given percentage.

Currently, there is approximately 6,000 acre-feet of unallocated water from Nacimiento. This unallocated water is available for future use in the county through direct delivery, water wheeling or water transfers. Any “Plan B” will probably use some or all of this unallocated water.

**17. Is the depression in the Estrella/Creston Area of Concern caused by overpumping or slow recharge?**

The cause of the depression is probably both overpumping and the low transmissivity<sup>1</sup> of the Paso Robles Formation where the basin's groundwater exists.

**18. What percentage of the total water use in the basin can be addressed through County land use measures?**

In general, County land use measures could potentially affect water demand from the rural/small community, small commercial and a small portion of the urban pumping sectors. These sectors comprise a little more than 15 percent of the

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<sup>1</sup> Transmissivity refers to the rate at which water of a prevailing density and viscosity is transmitted through a unit width of an aquifer or confining bed under a unit hydraulic gradient.

total water demand in the basin, as shown in the following table, which uses the 2010 demand figures in the Fugro 2010 Water Balance Review and Update. Therefore, roughly 15 percent of total water demand in the basin could potentially be affected by County-enacted land use measures.

Pumping Sector	Acre-Feet	% of total demand	County Control?
Agriculture	64,023	66.8 %	No
Urban	14,720	15.3 %	< 1000 ac-ft
Rural/Small Community	12,018	12.5 %	Yes
Small Commercial	2,736	2.8%	Yes

**19. How does Monterey County pumping effect the basin?**

Because it is a single groundwater basin, pumping in any one area of the basin can have an effect on the whole basin. Therefore, estimated pumping in Monterey County is part of water demand in the basin. Similarly, inflows into the basin in Monterey County are part of groundwater supply. However, much of the Monterey County portion of the basin is down gradient from San Luis Obispo County, so there should not be a significant effect on the portion of the basin in this county.

**20. When will the Nacimiento pipeline be complete and in operation?**

According to the Project Manager John Hollenbeck, the project will be complete at the end of 2010. Operations are expected to start in May 2011.

**21. Is the recommended LOS III based on the current situation or the situation at buildout?**

The LOS III recommendation is based on the dependable water supply, the current demand and the amount of time needed to correct any problem, as described in the following Resource Management System LOS criteria. The criteria do not include the supply and demand at buildout.

*A Level of Severity III exists when water demand equals the available resource; the amount of consumption has reached the dependable supply of the resource. A Level III may also exist if the time required to correct the problem is longer than the time available before the dependable supply is reached.*

*Level II for a water resource occurs when water demand projected over seven years (or other lead time determined by a resource capacity study) equals or exceeds the estimated dependable*

*supply. Seven years is the estimated minimum time required to develop a major supplementary water resource to the point of delivery to users.*

*Level I is reached for a water resource when increasing water demand projected over nine years equals or exceeds the estimated dependable supply. Level I provides two years for preparation of resource capacity studies and evaluation of alternative courses of action.*

Both the water balance update (Fugro 2010) modified to account for agricultural and rural growth and the documented groundwater declines support an LOS III.

**22. What are the definitions of the terms “urban” and “rural” as used in the RCS’ recommended actions?**

These terms are defined in the County General Plan’s Land Use Element and apply to unincorporated areas only. Urban is defined as lands located inside a community’s Urban Reserve Line (URL). Rural is defined as lands located outside a community’s URL. A URL may or may not be coterminous with a city’s boundary or sphere of influence. Lands inside a city are not subject to the recommended actions of the RCS.

**23. How well does the basin respond to groundwater banking?**

The County Flood Control and Water Conservation District studied the potential for groundwater banking in the Paso Robles Groundwater Subbasin Water Banking Feasibility Study Final Report. The report reaches the following conclusions regarding groundwater banking potential in the basin:

- Alternative 1a (Shell Creek area) appears to be the most viable of the recharge alternatives based upon the percent of recharged water remaining in storage, and cost.
- Alternative 2a (Creston area) is the least favorable due in large part to the hydrogeologic conditions which result in reduced effectiveness for recharge operations.
- Alternative 3a (Salinas River/Highway 46 area) is considered less favorable because of the higher cost and the potential environmental and hydrologic impacts (losses) to the Salinas River.

**24. Are private wells located within cities accounted for in the pumping figures?**

A review of the water demand reports such as Todd 2009 indicates that private wells inside city limits, to the extent they were readily known, were a part of the

pumping calculations. (For example, the golf course in Paso Robles, small commercial along 46E, etc. The agencies were asked if those wells existed, and they said if there were any, there were very few).

**25. In regard to Conservation and Open Space Element (COSE) Policy WR 1.2, Conserve Water Resources, what is the estimated range of water that can be saved through conservation, and what types of conservation technology would be involved to achieve such a savings?**

This policy does not include a range of possible levels of water conservation. However, COSE Policy WR 4.1 sets a goal of 20% per capita reduction in water demand by the year 2020. Conservation technologies that could be employed to achieve this water savings include simple measures such as plumbing retrofits and more comprehensive measures that include:

- Conservation Rate Structure (i.e. Tier Water Rates)
- Turf conversion rebates
- Lawn aeration rebates
- Sprinkler nozzle replacement rebates
- Irrigation controller rain sensor rebates
- Weather based irrigation controller and soil moisture sensor rebates
- High efficiency clothes washing machine rebates
- High efficiency toilet rebates
- School education programs
- Free seminars on water conserving landscape design and plant selection
- Free landscape/home water surveys
- Annual Water-Conserving Landscape awards

There are references available on the internet that document water savings results from the various methods.

**26. How much could existing water consumption be reduced through more extensive use of greywater and water recycling?**

Theoretically, given an adequate supply of greywater, a home's entire outdoor use could be from this non-potable source. In the North County's climate, outdoor water use is usually 60-65% of a home's total water use.

**27. Attachment 2 in the staff report appears to show a number of groundwater depressions throughout the basin. What intervals do these contour lines represent (5 ft, 10 ft, 20 ft)? Is there a map available with these labeled? Could this map be overlain on an aerial photo?**



The contour interval on this map is 10 feet. A revised map will be provided with a future draft of the RCS with contour intervals and an aerial photograph.

**28. Is LOS III the same as overdraft?**

The RMS defines an LOS III in terms of water demand and available resources, not overdraft:

A Level of Severity III exists when water demand equals the available resource; the amount of consumption has reached the dependable supply of the resource. A Level III may also exist if the time required to correct the problem is longer than the time available before the dependable supply is reached

Based on the water balance table and the mapping of the prolonged and widespread decline in groundwater levels, the basin is at an LOS III. The RCS does not make a finding about whether a condition of overdraft exists.

**29. What happens if an LOS III is reached? Will the County continue to secure supplemental water? What happens to development applications that are still in process?**

If the Board of Supervisors certifies an LOS III, then it will approve certain actions to be implemented. Many of those actions will require a subsequent public hearing process. The RCS recommends a number of monitoring and land use actions.

The unallocated supplemental water (Nacimiento and State Water) is still there for future use somewhere inside or outside this basin. Development applications in process will continue consistent with state law. For example, if a subdivision application is accepted for processing prior to implementation of the recommended land use measures, then the subdivision can proceed under the rules in effect at the time of application acceptance.

**30. Provide examples of what would meet the requirement that all new urban discretionary development offset new water use with non-agricultural water.**

In urban areas such as San Miguel that do not have access to supplemental water, water use could be offset through plumbing retrofit programs, cooperative agreements with water purveyors with access to supplemental water and/or implementation of conservation programs where water conservation can be quantified.

**31. Why can't subdivisions offset their water use?**

The basin's pumping has reached or is close to its perennial yield. New parcels created by subdivisions could exacerbate this problem. There are already thousands of existing undeveloped parcels in the rural areas of the Paso Robles Groundwater Basin that could potentially be developed. The limitation on land divisions comes from the Conservation and Open Space Element (COSE). COSE Policy WR 1.13 generally precludes the approval of general plan amendments and land divisions that increase the density or intensity of non-agricultural uses in rural areas that have a recommended or certified Level of Severity II or III for water supply.

**32. Are the secondary and incidental visitor-serving components of a winery subject to RCS recommendation A3 requiring offset, in addition to the BMPs (Best Management Practices), or are they subject only to the BMPs?**

These uses will be subject to the offset requirements as well as the BMPs. However, implementation of the BMPs will reduce the amount of water that must be offset.

**33. In regard to the RCS recommendations involving the Growth Management Ordinance, what does "substantially limit" (yearly non-agricultural development) mean? What is the new growth cap going to be?**

"Substantially limit" means a meaningful reduction in development in the applicable geographic area in order to minimize its impacts on the groundwater basin and reduce conflicts with agricultural water use. A specific growth cap would need to be established through a subsequent public hearing process.

**34. How will the amendment to Title 19 (the Building and Construction Ordinance) in the Estrella/Creston Area of Concern be implemented? What type of amendments would occur? Are they easily implemented?**

An amendment to Title 19 to offset new water use would probably be similar to the Title 19 ordinance amendments to address groundwater in the Nipomo Mesa and Los Osos areas. In some communities such as Los Osos, offsetting water use is relatively easy due to an older housing stock that includes many high water-using plumbing fixtures. In Nipomo, simple plumbing retrofits like those in Los Osos are not very effective due to the newer housing stock's more efficient use of water.

**35. Does the RCS include environmental water demand, for example, to support riparian (vegetation along streams) habitat?**

The RCS does not specifically speak to environmental demands of water. However, the Master Water Plan now under preparation does include environmental water demand.

**36. Does the RCS take into account the higher amount of groundwater recharge that is envisioned as a result of new regulations?**

No, the RCS does not assume changes in recharge due to such things as Low Impact Development (LID) or stormwater plans.

**37. What is the basis for the assumption of a 1.7% annual increase in rural pumping?**

According to Todd 2009, rural water demand in years 1997, 2000 and 2006 was:

1997	9400 acre feet
2000	9993 acre feet
2006	10,891 acre feet

The average yearly change is approximately 1.7% per year.

**38. What is the degree of connection between the Atascadero Sub-basin and the main Paso Robles Groundwater Basin?**

*The response to this question is provided by Paul Sorensen of Fugro.*

The basin studies include statements regarding the connectivity between the Subbasin and the main Basin. Based on the results of the work described in the Paso Robles Groundwater Basin Study Phase I (August 2002), the eastern boundary of the subbasin is the Rinconada fault. Throughout the southern portion of the Subbasin (in the vicinity of the City of Atascadero), the fault displaces the Paso Robles Formation and juxtaposes Basin sediments on the west side of the fault with relatively impermeable sediments (Monterey Formation). In the northern portion of the Subbasin (south of the City of Paso Robles), the Paso Robles Formation is found on both sides of the Rinconada fault, however, the fault zone forms an apparent leaky boundary between the Atascadero subbasin on the west and the main part of the Paso Robles Groundwater Basin to the east.

The hydraulic connection between the Basin aquifer sediments across the Rinconada fault is sufficiently limited or restricted to warrant the classification of a separate Atascadero subbasin.

Outflow (primarily surface flow and Salinas River underflow) from the Subbasin enters the Estrella Area. Although the Rinconada Fault acts as a leaky hydraulic barrier between the Paso Robles Formation sediments in the Atascadero Subbasin and those in the Paso Robles Basin, the fault does not extend to the ground surface and consequently does not pose a barrier to groundwater flow in the shallow alluvium. Thus, the Salinas River underflow and surface flow forms a limited (albeit extremely important) hydraulic connection between the Subbasin and the main Basin.

This description of the sub basin states that outflow from the Atascadero sub basin (primarily the river) enters the Estrella sub area of the main basin. So, we know that the sub basin outflow does affect the main basin in the Estrella sub area. The second statement indicates that some outflow occurs across the "leaky boundary".

**39. How was the 1.7 acre-foot/year for rural pumping determined?**

The 1.7 acre-foot/year rural pumping demand was taken from the County Master Water Plan:

*"The calculation of water needs for the Rural Areas was fairly straightforward and based primarily upon the number of rural dwelling units, or "ranchettes" multiplied by a water duty developed for each of the Water Planning Areas (WPAs). A number of assumptions were used for development of the water duties based on professional knowledge of the County and development of rural demands in adjacent counties. Interior household water use was assumed to be similar to a household in town. The average is about 1/3-acre feet per acre. This number may go down somewhat in the future as new homes are built with greater water saving devices. However, the change will not result in a significant modification of the estimates of water demand by rural residences."*

*"The calculation of exterior water needs is the more complex. Acreage varies considerably from ranchette to ranchette, ranging from approximately 2 1/2 acres on up to 20 acres or more. Looking at numerous rural developments, it was determined that most places "cultivate" about an acre around the dwelling, leaving the remaining acreage unimproved or in its natural state, or for use as a corral. This is generally true no matter how large the parcel. Most of the exterior water use is within that acre of cultivation. Watering lawns, small orchards, gardens, and stock varies widely from parcel to parcel. However, a reasonable range of 1/2 AFY to 3 AFY per ranchette was developed. For this estimate, total water use of 1.3 AFY was assigned for the coastal areas and 1.8 AFY for inland areas. Coastal areas were presumed to use less because of the cooler, moister climate. Studies have been completed*

*for Monterey County (by members on the Master Water Plan team) and Santa Barbara County for similar water use and these guidelines appear reasonable based upon historical use in the area. Given the relatively small percentage of total demand that constitutes rural demand (approximately 3%), overall figures are not greatly affected by this assumption."*